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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,358	07/18/2001	Miri Park	40682/MJM/A717	1227
23363	7590	04/15/2004	EXAMINER	
CHRISTIE, PARKER & HALE, LLP 350 WEST COLORADO BOULEVARD SUITE 500 PASADENA, CA 91105			CHEN, KIN CHAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/909,358

Applicant(s)

PARK ET AL.

Examiner

Kin-Chan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 25-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 30 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. Claims 30 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification (such as bending the imprint master such that the central portion of the imprint master first contacts the deformable material in claim 30; unbending the imprint master such that the peripheral portions of the imprint master contact the deformable material in claim 31). Applicant is required to point out where the support is in the specification, if any.

Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear that how contacting the deformable material comprises unbending the imprint master.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US 5,772,905).

In a method for patterning a substrate, Chou teaches that a substrate may be provided. A negative image of a pattern may be provided in a fixed medium on a body (so-called imprint master in the claimed invention). The body may be silicon or other materials. A deformable material (such as polymer) may be formed over a surface of the substrate. The deformable material may be contacted with the negative image of the pattern thereby the deformable material is deformed into the pattern over the surface of the substrate. The body (imprint master) may be removed from the substrate and the pattern may be transferred into the substrate. The step of heating (such as heating to a temperature higher than glass transition temperature to soften the deformable material, col. 4, lines 61-67) may be performed during the step of contacting. The substrate may be etched using the deformable material as a mask. See col. 4, lines 7-55; col. 6, lines 13-18 and 31-40.

Chou is silent about the silicon (or other materials) of the body may be flexible. However, it is expected that it is mechanically relatively flexible as compared with typical steel mold. Furthermore, it is obvious to one skilled in the art that when the silicon substrate is thin, it becomes bendable (flexible), applicant's disclosure admits and recognizes the fact (see page 4, lines 4-5 of applicant's disclosure). Also see Tsuya et al. (US 4,363,796) or Little et al. (US 4,470,856) in the record as evidences.

As to claim 5, Chou is not particular about the substrate being used in the process. Hence, it would have been obvious to one with ordinary skilled in the art to use a composite of a layer of InP formed over InGaAsP or InGaAs. Because it is one of most popular materials used in the semiconductor and optoelectronics industries.

As to dependent claim 14, because Chou teaches that the invention is suitable for where nanolithography is required (col. 4, lines 4-6). Hence, it would have been obvious to one with ordinary skilled in the art to have the pattern that includes a grating structure because it is a very common structure in optoelectronics industries.

As to claim 19, Chou recites examples of materials for fixed medium and the body (imprint master) and is not limited to materials being used in the process. Hence, it would have been obvious to one with ordinary skilled in the art to use PDMS. Because it is one of most popular materials used in the semiconductor and optoelectronics industries.

Dependant claim 24 differs from the prior art by specifying various sizes and dimensions. Because same are merely a matter of choices of design depending on the product requirements, it would be obvious to one skilled in the art to use various dimensions for fabricating a semiconductor or optoelectronics device in order to accommodate the specific product design and meet the product requirement.

The above-cited claims differ from Chou by specifying well-known features and common practices (such as using mold release, forming the pattern by optical or e-beam lithography followed by RIE) to the art of semiconductor or optoelectronics device fabrication. It is the examiner's position that a person having ordinary skill in the art at

the time of the claimed invention would have found it obvious to modify Chou by adding any of same well-known features (and common practices) to same in order to provide their art recognized advantages and produce an expected result. It is noted that applicant did not traverse the aforementioned conventionality (e.g., well-known features, obviousness), which have been stated in the office action (December 5, 2003).

### ***Response to Arguments***

3. Applicant's arguments filed March 8, 2004 have been fully considered but they are not persuasive. Applicant has argued that Chou does not teach silicon substrate or other material may be flexible. It is not persuasive. As has been stated in the office action, it is expected that it is mechanically relatively flexible as compared with typical steel mold. Furthermore, it is obvious to one skilled in the art that when the silicon substrate is thin, it becomes bendable (flexible), applicant's disclosure admits and recognizes the fact (see page 4, lines 4-5 of applicant's disclosure). Also see Tsuya et al. (US 4,363,796) or Little et al. (US 4,470,856) in the record as evidences.

Applicant has argued that Chou teaches that the substrate 18 and body 12 should be sufficiently stiff to reduce bending. It is not persuasive. Because Chou uses the clause of "sufficiently stiff to reduce bending" is simply comparing with the deformable material 20 which may be thermal plastics and being heated to a temperature higher than their glass transition temperature and therefore softened (see col. 4, lines 61-67).

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin et al. (US 5,358,604) and Nebashi et al. (US 6,120,870) teach patterning a substrate using a negative image of a pattern. Tsuya et al. (US 4,363,796; abstract) or Little et al. (US 4,470,856; col. 1, lines 26-27) discloses that silicon substrate may be flexible.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 12, 2004



Kin-Chan Chen  
Primary Examiner  
Art Unit 1765

K-C C